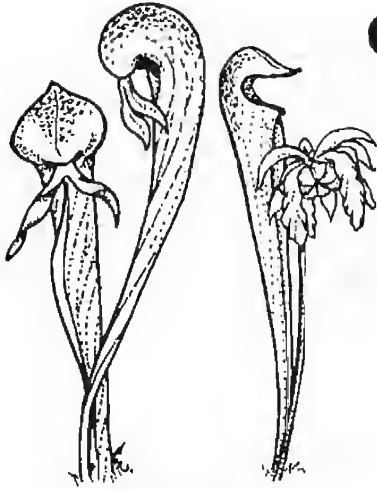


CARNIVOROUS PLANT NEWSLETTER

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CARNIVOROUS PLANT NEWSLETTER

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Front cover: Mt. Kinabalu Park, old administration with Kinabalu in background.
Photo by Perry Malouf.

Rear Cover: Marker on summit trail to Kinabalu, with author's Thai friend. Photo
by Perry Malouf. His Kinabalu adventure begins in this issue. (Ed. comment --
Would it not be wild if all CP areas were signed this way?)

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President - Rick Walker, MS 26U4, P.O. Box 10350, Palo Alto, CA, 94303-0867

Phone: (415) 856-2354 Email: walker@opus.hpl.hp.com

V. Pres. - Christoph A. Belanger, 88 Strathmore Rd., Apt#4, Brookline, MA 02146

Phone: (617) 739-9795 Email: cbelan9630@aol.com

Sec/Treas - Kevin Snively, P.O. Box 1013, Everett Wa. 98206-1013

Phone: (206) 252-2911 Email: ksnive@pstbbs.com

Coeditors

D.E. Schnell, Rt. 1, Box 145C, Pulaski, VA 24301

J.A. Mazrimas, 329 Helen Way, Livermore, CA 94550

Steve Baker, Rt. 1, Box 540-19AB, Conover, NC 28613-(SteveB@aol.com)

Seed Bank: Tom Johnson, P.O. Box 12281, Glendale, CA 91224-0981., (Carnipla@aol.com)

Business Manager: Leo C. Song, Jr. (LeoSong@fullerton..edu)

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THE SAVAGE GARDEN

“It came from Hollyweird”

by

Peter D'Amato
California Carnivores
7020 Trenton-Healdsburg Road
Forestville, CA 95436
(707) 838-1630

I must admit it gets a little tedious, but inevitably, at least weekly, someone comes into California Carnivores and asks, “where’s Audrey?”, usually with a smirk on their face, as though this is certainly one plant we do not grow. With some indifference, I point her out. “She’s over there.” Chuckles and grins, as sure enough there she sits: Audrey II from “Little Shop of Horrors”. Of course, she’s a small, plastic mechanical bank that eats - not people - but coins. She’s a little tattered along the edges, a little loose-lipped in her old age, but she gobbles up pennies and quarters with gusto, which we donate to the Nature Conservancy. Some of the people who demand to see her look like plant food to me.

Now Audrey II may be the most famous man-eating plant from Hollywood, especially after the popular 1986 movie version of the hit Broadway musical, but strange plants, carnivorous or not, have haunted Hollywood since its golden age.

When I was a tiny tot, the original 1960 Roger Corman shot-in-three-days film of Little Shop of Horrors left quite an impression on me. In that version, Audrey was not an alien from outer space teleported to earth, as she was in the later musical version. Actually Seymore created her by - get this - hybridizing a venus fly trap and a *butterwort*! I think it is the only time the word “butterwort” is uttered on the screen. Even in the popular PBS Nature documentary “Deathtrap”, butterworts make a brief screen appearance but the narrator fails to identify the plant. When I once told this to a small boy who was amassing his own carnivorous plant collection, he gleefully told me he was going to try to hybridize his own flytraps and butterworts to see if he could make an Audrey II. I have never seen him since.

However, in Hollywoodland and other film studios, similar scientific experiments have proven successful, often with dire results.

After Little Shop of Horrors, probably the best known is the 1963 version of “Day of the Triffids”. This is a shame, for although this Howard Keel-Janette Scott movie is well-rated and often shown on late night TV, it truly missed the point and plot of John Wyndham’s classic and marvelous novel, still in print after 45 years. I must admit my all-time favorite “man-eating plant” movie is the 1981 three-hour BBC mini-series of “Day of the Triffids”, which debuted on PBS in 1986, and is occasionally shown on obscure cable stations. Although a little slow-moving at times, this masterpiece-theater-like production follows the novel almost page by page.

John Wyndham was ahead of his time. In “Triffids” he foresaw genetic engineering, star-wars technology, viral plagues, and oil shortages, to name a few. Wyndham’s running theme in his novels was to pit humankind against advanced species of

lifeforms, as in his other bestseller "The Midwich Cuckoos", twice filmed as "Village of the Damned."

For those not familiar with the complex plot of "Triffids", the story is basically this: through genetic experiments, a Russian scientist develops a plant to be used for the production of oil. This oil can be used as a replacement for petroleum, so it is a very valuable plant indeed. A Russian spy attempts to smuggle out seed to a western petroleum company, but his plane is shot down. The "vapor-like seed" drifts through the atmosphere, and in a few years triffids begin popping up all over the place. The trouble with triffids is that they are 10 foot tall plants that can uproot themselves and shuffle around on three "stump legs". Worse, they have whip-like stingers that can kill a man 15 feet away. Even worse, they hang around the rotting corpse and suck out its juices! When it is realized that this new carnivorous species is the mysterious oil plant from Russia, production begins and the plants are grown by the millions on triffid farms for oil. Some people dock the stingers once a year and chain them up in their yards as "pets".

Actually, all this takes place before the novel and mini-series actually begins. The story centers on a triffid farm employee who, recuperating in a hospital after eye surgery due to a sting, misses out on a world-wide all-night-long cosmic light show, caused, scientists believe, by "cometary debris." Actually it is a star-wars experiment gone horribly wrong. The next day, about 99% of the world's population wakes up blind! Our hero, and the few other sighted individuals left, soon have to fight from becoming "slaves" of the surviving blind population. Meanwhile, triffids break free from their farms and begin breeding like cape sundews, stinging anything in their path. By the time the novel ends many years later, and after an ebola-like virus adds further to the horrors, our hero and a few others who lived through it all end up barricading themselves in electrified fortresses, with herds of triffids outside the gates from one horizon to the other.

Generally, true carnivorous plant monster movies go downhill from there. However, many people fail to recall that in some of our best horror movies the monsters were still plants, whether they ate people or not. In what is probably my own favorite horror movie, the plant monsters do not sting or chomp human victims at all. Instead, they duplicate flesh and blood into cellulose and chlorophyll. This, of course, is the famous 1956 version of "Invasion of the Body Snatchers." Here, the enemy is a plant from outer space, a seed of which falls in a small California town. A doctor in the town, and the narrator of Jack Finney's popular novel "the Body Snatchers", begins to have patients claiming "their father isn't their father and their aunt isn't their aunt." We soon find out these alien plants produce watermelon-like pods from which hatch human duplicates while the original model disappears. Carolyn Jones, who would later feed "Cleo" in the Addams family, utters the best line in the movie as she watches a pod hatch. "Is that me?" These duplicates look and act like the original, but with subtle difference. Such as they behave just like communists do, with a sort of collective mind-think and a lack of individualized personality so feared in 1950's America. The movie was remade in 1978, a major and disappointing change being that the duplicates became dark and brooding conspirators, rather than the happy "est-like" victims of Finney's novel. The 1993 sequel to that film was even worse. In Finney's original novel, the plants duplicated *everything*. The first victims were a couple of Del Monte Tomato cans! Also, the duplicates only lasted a few years, when they crumbled into dust. The plants had left Mars a dusty wasteland and were now on earth, copying houses and people and even other plants. In the novel, humans fight back, and the pods end up flying off back into space, to search out more agreeable victims.

The other classic plant monster is "The Thing" (from Another World). John Campbell's story "Who goes there" is more like the 1981 remake by John Carpenter, which itself is more like a body snatcher movie, and not even a plant. But in Howard Hawk's 1951 classic, we should remember that the humanoid who crashes his space ship in the arctic, and who was played by Jim Arness, was indeed a plant. He could regenerate torn limbs, and had seed capsules on his fingers! When the seed was planted in soil, little plants grew like pea pods - when watered with human blood! Inside these pods came the eerie sound of an infant's wail, almost as eerie as Dimitre Tiomkin's score. The thing gets cooked at the end of the film by electrocution. Sadly, Charles Lederer, who wrote the screenplay, failed to check with a botanist about true plant wonders of this earth. He makes something up about the telegraph plant which is nothing like the *Desmodium gyrans* that I grow, and mentions another fantasy plant (the Century Plant) that catches small animals. He could have had the actors talk about *Nepenthes rajah* or even the flytrap, but alas, that's Hollywood. Many other plant horrors can be seen on late night TV, but here I will mention only a few.

"From Hell It Came", 1957. A wonderfully awful picture about a native on a South Pacific Island who's condemned to death for befriending westerners doing - what else? - radioactive experiments. His fellow villagers drive a wooden stake through his heart and bury him in sacred (radioactive) ground. A tree grows above the grave, more like an old stump with a few arm-like branches and a "face" of gnarled, knotty wood complete with a stake in its trunk. A "tabunga", the natives call it. Soon it's shuffling around killing the villagers who killed him!

In "The Unknown Terror", 1957, a mad scientist in South America develops a carnivorous fungus that looks like a bubble bath. He locks victims in a cave where the fungus pours out of cracks to devour anything that moves.

In "Navy versus the Night Monsters", 1966, Mamie Van Doran is attacked by carnivorous monster plants.

It's a space station that's under siege in the 1969 Japanese/American film, "The Green Slime."

George Coulouris feeds scantily-clad prostitutes to the carnivorous tree he grows in his mad-scientist basement laboratory in 1959's "The Woman Eater."

Only semi-plant-monster-oriented, another of my favorite late-nighters is the rather excellent "The Creeping Unknown", which starred Brian Donlevy in 1956. In this atmospheric British thriller, a rocket is sent into space with three men aboard. It crashes back to earth with only one rather comatose survivor and two pools of jelly. An alien something-or-other now inhabits the body of this lone astronaut, and it needs to absorb other life forms to survive. It literally becomes what it eats, and its first good meal is a cactus plant on a hospital room windowsill. "It" escapes the hospital with the help of his wife, who does some of the best hysterical screaming in cinema history when she discovers her husband now has cactus body parts! Loose in London, it has a huge buffet at the local zoo, and turns into... into... well - a creeping unknown!

Strange plants have also made brief appearances in "Werewolf of London", 1939; "Island of Lost Souls", 1933; "Angry Red Planet", 1959; "Konga" (about a giant ape), 1961; and "The Land Unknown", 1957.

What about *real* carnivorous plants in movieland?

A few years ago in CPN it was mentioned that *Sarracenia* had brief appearances on the screen. *S. leucophylla* adorned restaurant tabletops in "Weekend at Bernie's", and *S. flava* were seen in "Mississippi Burning."

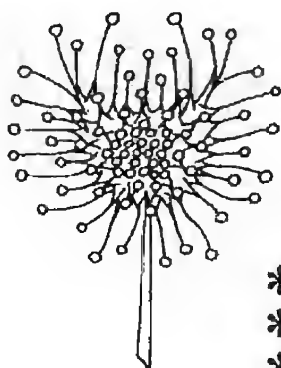
The earliest carnivorous plant supporting role that I can find was in 1935's "Mad Love", starring Peter Lorre. Lorre plays a demented surgeon who performs hideous operations on those he dislikes, namely the handsome pianist who has stolen the love of the girl he admires. When he isn't mutilating the hands of musicians, he's feeding his pet *Darlingtonia* bits of meat. And the cobra plant's "tongue" promptly "rotates" with each mouthful!

In Ginger Rogers' academy award winning role in 1940's "Kitty Foyle", her beau gives her - a bouquet of *Darlingtonia*! The tongues don't move in this one, but he does describe it as a "Malaysian flesh-eating plant."

And finally, two versions of Tennessee Williams' "Suddenly Last Summer" have been filmed. The venus flytrap plays a symbolic role in the opening scene. In the 1959 version, Katherine Hepburn shows Montgomery Clift how "Lady" eats flies, provided by her attentive maid in a little box. Of course, the *Dionaea* is actually a model of a rather peculiar *Nepenthes* - and the lid closes when the fly is dropped in! The 1992 version with Maggie Smith is less defined. A flytrap appears as a blur on the screen, with leaves about 16 inches long!

In closing, I'd like to mention a missed opportunity. A few years ago California Carnivores was hired to help decorate a set for a sci-fi movie that was in the planning stages. "Ectopia" was its name. All about horrible mutations in a future world. The director Renee Daalder, who did "Massacre at Central High", had a big photo of cobra plants over his desk. They were going to move most of our greenhouse in a van down to the studios in Hollywood for a few days! Special effects people were going to create scenes of giant sundews and other horrors eating actors like Elizabeth McGovern and Tom Cruise. But alas, at the last minute, the movie was shelved. That, as they say, is Hollywood.

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S. flava Fitzgerald GA
S. flava veined Fitzgerald GA (3)
S. flava Irwin Cty GA
S. flava purple throat
S. flava ornata (4)
S. leucophylla
S. leucophylla Perdido, AL (5)
S. leucophylla Gulf Breeze, FL
S. minor Ocillo GA
S. minor, Ben Hill Cty GA
S. minor Irwin Cty, GA
S. minor Fitzgerald GA
S. oreophila
S. psittacina Fitzgerald GA
S. psittacina Ocillo GA
S. purpurea
S. purpurea purpurea
S. purp venosa, Mtn Bog Form
S. purp venosa v. burkei
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S. X minor X oreophila (2)
S. minor X (ala X leuco) (2)
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S. purp ven X (ala X leu) (3)
D. arcturi Lewis Pass NZ
D. aliciae
D. adelae (2)
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D. binata dichotoma small form wht flwr (3)
D. binata Haraki Plain NZ
D. binata North Plains, NZ
D. bulbosa
D. brevifolia (4)
D. burkeana (10)
D. burmannii
D. burmannii Berwah, QLD (6)
D. callistos (1)
D. capensis
D. capensis 'alba'
D. capensis 'Narrow Leaf'
D. capensis red (2)
D. capillaris (4)
D. capillaris "long Leaf" (5)
D. capillaris pk flr (2)
D. collinsiae "Faryland" (2)
D. dielsiana (13)
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D. filiformis filiformis NJ Pine Barrens
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D. fili fil X CA Sunset (3)
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D. indica grn plt, pk flowers (3)
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D. intermedia Czechia (10)
D. intermedia 'Carolina Giant'
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A Visit to Kinabalu Park

by

Perry Malouf (5308 Carlton St., Bethesda, MD 20816-2304)

Introduction

Kinabalu Park is a national park in the state of Sabah, East Malaysia, located on the island of Borneo. It has a reputation for being a nature lover's wonderland, sporting interesting varieties of flora and fauna, many of which are endemic to the region. Most notable from the carnivorous plant enthusiast's point of view are the many species of *Nepenthes* found on Mount Kinabalu, the area's namesake and the tallest peak in southeastern Asia. Some of the rarest and most famous *Nepenthes* are found only on the slopes of this mountain. Shigeo Kurata's book entitled "*Nepenthes of Mount Kinabalu*" provides an extensive description of the *Nepenthes* found in and around the Park. I wanted to see some of these for myself and so I decided to spend one week there.

The Park is a popular retreat on weekends and holidays, the major attraction being the hike up the summit trail of Mount Kinabalu. No mountaineering equipment is needed since the trail is well-maintained (albeit physically demanding). Typically the hikers proceed to an overnight hut at 3353 m where they spend the night. (The restaurant at this hut is supplied by porters who carry food, propane, and paper goods up the summit trail every day). At 3 a.m. the next day the hikers set off for the summit where they watch the spectacular sunrise. Everyone who reaches the summit is awarded a certificate. I elected to spend the time looking for *Nepenthes* instead of hiking to the summit.

For the benefit of other enthusiasts who might want to plan their own visit, I include here a few helpful details. The Park facilities include various lodging accommodations which must be reserved in advance. Inquiries for booking and other correspondence may be addressed to:

The Director, Sabah Parks
First floor, Lot 1-3, Block K
P. O. Box No. 10626
88806 Kota Kinabalu
Sabah, Malaysia
voice phone 60-88-211881
fax 60-88-221001

where 60 is the country code for Malaysia, and 88 is the region code for the city of Kota Kinabalu and surrounding areas. Kota Kinabalu is the capital city of the state of Sabah, and it is on the north coast of Borneo. Kinabalu Park is a two hour drive into the mountains from Kota Kinabalu. Several airlines service the airport at Kota Kinabalu, and I and a Thai friend flew Malaysian airlines from Bangkok, Thailand (where I was vacationing) via Malaysia's capital Kuala Lumpur, to Kota Kinabalu. The second leg of the flight took about two and a half hours. We arrived on Sunday afternoon, November 27. A taxi from the airport to the Hyatt hotel in Kota Kinabalu cost MR30 (MR = Malaysian Ringgit, and US\$1 = 2.5 MR).

My plan was to overnight at the Hyatt hotel, and then head for the Park on Monday morning. Around the Hyatt hotel are shopping malls, and sidewalk restaurants where we ate with no ill effects (everything we ordered was well cooked and still

hot when brought to us). We drank bottled water always, even in the hotel. The hotel staff spoke English fairly well, and the people in the sidewalk restaurants spoke enough broken English for us to get by easily. There was also a pharmacy nearby where I bought some decongestant. As nearly as I can tell, you do not need a prescription for most medications that require one in the U. S. I had brought anti-malaria medication with me from the U. S. On Monday morning our departure was delayed because I had to wait for the banks to open at 9 a.m. in order to exchange currency. Although the hotel also exchanges currency, they have a daily limit which I easily wanted to exceed. Since our departure was delayed we could not take advantage of tour bus transportation to the Park which would have cost MR40. Instead I hired a taxi which cost me MR100, considerably more than the tour bus but still not unreasonable for a two-hour one-way ride which, by the way, is very scenic.

Arrival: The first half-day in the Park

My Thai friend and I arrived at the Park just after 1 p.m. on Monday afternoon, registered at the front office cabin, and then headed to our quarters in the Old Administration building. Near the Park entrance (at 1500 m) is a souvenir shop, the New Administration building, and a network of roads which wind through staff quarters, a recreation facility, and on up the mountain past lodgings and the Old Administration building. From there the road continues up one more kilometer to the entrance gate of the summit trail, which is near a power station that supplies electricity to some radio transmitters farther up the mountain. Around the Old Administration building are extensive trails through the forest, and also a mountain garden which is maintained by the staff. The Old Administration building itself houses a restaurant (which sustained us during our stay), exhibit hall, slide show theater, and some lodging. Our room was in the basement of the Old Administration building. It was fully furnished and included a private bath. My only complaint was that it was

very humid to the point where the bed blankets were damp to the touch, and there was an ever-present smell of mildew. Still, it was reasonably comfortable for MR80/night. Our excursion in the Park would consist of day-hikes only, since the more distant areas which required camping equipment were beyond our capabilities at the time. Besides essential toiletries, medication and clothing, we brought insect repellent, panchos, a portable water filter, cameras, and a knapsack.



Fig. 1 -- A misty segment of trail to Kinabalu summit described as "gentle". Photo by Perry Malouf.

After settling in, we walked back down the road to the New Administration building, where we met both the head botanist of the Park and our guide for the entire week. The four of us outlined the week's schedule, and then we were taken to the herbarium where there were many specimens of dried *Nepenthes* pitchers. I saw *N. villosa*, *N. rajah*, *N. lowii*, and most striking was a dried pitcher of *N. edwardsiana*—35 cm tall! I would have loved to have seen the plant from which this pitcher was taken, but was never presented with the opportunity. Our guide then took us

on a tour of the mountain garden.

This garden contains plants collected from all over the Park: orchids (most of which were not in bloom, unfortunately), rhododendrums, and—NEPENTHES! There were three *N. rajah* plants measuring 50 cm high and almost a meter across, with pitchers the size of large grapefruits (not including the lid). These plants were not fully grown, and there were several smaller specimens in pots. The only *N. edwardsiana* we would see during our trip was near the *N. rajah*, and it had one mature pitcher 15 cm tall and also two developing pitchers which had not opened yet. Other *Nepenthes* included several *N. tentaculata*, two *N. fusca*, one *N. lowii*, and another species I could not identify. Only the *N. tentaculata* and *N. fusca* grew wild in the garden (the other *Nepenthes* had been transplanted there), and in fact both of these could be found along the trails around the Old Administration building. I began taking photographs, and even with ASA400 film I needed a flash. This was due partially to the fact that I was taking close-up shots with my zoom lens. Typically, though, the entire area often becomes shrouded in clouds by mid-day, and the diffused sunlight filters through the dense forest canopy before reaching the *Nepenthes* on the forest floor. The lighting on the forest floor was not bright and a flash was essential since I did not have a tripod for long exposures.

After the mountain garden tour, our guide asked us to meet him the next morning in front of the Old Administration building at 7:30, and then left for the day.

Tuesday: The trek up the summit trail

On Tuesday morning, Dec. 29, we had a decent breakfast and then met our guide as instructed. The skies were clear, and for the first time I could see the top of Mt. Kinabalu. Clouds had covered most of the mountain the day before, and I did not even know it was there. But this morning I could see it in all its majesty, from the densely forested portion all the way to where green gave way to grey rock, and upward to the summit. Two hours later the clouds would move in again and take the mountain from view.

Our guide was very kind to employ his four-wheel-drive vehicle, which he referred to as his 'jalopy', to take us around. It was a Toyota, and it looked like a hybrid between a jeep and a pickup truck. His brother-in-law bought it, had two accidents in it (one where he tumbled it sideways off the road, down the mountain, and onto another road), and then sold it cheap to our guide who repaired it as best as he could. The doors did not fit the door seals all the way around, the rear window and rear view mirror were gone, but the thing ran. We used it all week long and it took us over some very rough logging roads, through streams, etc. It was not really 'street legal', so when we ventured out of the Park we avoided the larger villages where we might have gotten ticketed. Soon I noticed that none of the dashboard gauges worked, and I asked how the fuel level was determined. The diesel tank protrudes behind the driver's door, and our guide confidently smacked the tank with his hand and determined the fuel level by the reverberation of the tank.

We drove up the road to the summit trail entrance at 1829 m, which is called the Timpohon Gate. I was wearing long safari pants, hiking boots, a T-shirt, a wind-breaker, and a small camera bag; my friend carried our backpack containing extra shirts, two panchos, water, lunch, and toilet paper. The summit trail is just that—an actual trail that leads up to the summit. Parts of it are a smooth and mild incline, and other parts resemble a muddy, steep, zigzag stairway that continues upward as far as

you can see. The hike is a very good athletic exercise, especially at these higher elevations. Even a person in good shape will breathe hard, and after one hour my shirt was soaked with perspiration even though the temperature never exceeded 24 °C. Our goal was to make it to the *N. villosa* areas at around 2700 m, which is about 4.5 km beyond the Timpohon Gate, and then do an extensive *Nepenthes* search on our descent back down the trail.

By 9:30 a. m. we had advanced 1.5 km and had passed two “shelters”, or what I would call open cabanas with primitive bathrooms off to one side. We began to see *N. tentaculata* on the side of the path, climbing through the other vegetation. I took pictures of several different plants, some with green pitchers and others with reddish-brown pitchers. As in the mountain garden, there is no direct sunlight in the area where these plants are growing. Prior to my visit, I had misconceptions about how *Nepenthes* grow in the wild. This was due to a photograph I had seen in a back issue of CPN (vol. 22, nos. 1 & 2, March & June 1993), which showed a hillside carpeted with *N. pervillei*. On Mt. Kinabalu the *Nepenthes* do not grow that way at all. Rather, you will find a plant here, another over there about 40 m away, etc. They tend to not grow in a dense colony. If you are not keeping your eyes peeled for *Nepenthes*, it is very easy to walk right past them without noticing.

We continued up the trail, and were overtaken by a few hikers on their way to the summit (they were not stopping to photograph *Nepenthes*). Not long afterwards I saw two women porters, whom I guessed to be in their 40's, coming up the trail with baskets of food on their backs. Soon to follow was a young man with a 30 kg propane tank on his back, also making very good progress. I truly admired their physical conditioning. These people were not wearing hiking boots but only light sneakers, and I was amazed at this since I considered my boots to be absolutely essential.

By 10:30 we had advanced 2.5 km up the trail, and our guide took us on a detour into the brush in search of a *N. lowii* he had located previously. We found it about 25 m off the trail. It was a long vine, rising up from the ground about 2 m, clambering horizontally along a fallen tree for another 2 m, and then reaching upward toward more light. It had three large and classic pitchers on it, and a male inflorescence. Nearby there were also a few small *N. tentaculata* plants climbing through the bushes. We made our way back to the trail and kept going upward, and soon encountered other hikers on the way down from the over-night hut at 3353 m (the one with the restaurant supplied by the porters). They were mostly young college students, and they had wanted to reach the summit the day before but could not because it had rained. They never made it beyond the hut, and today they were coming back down to go home.

After another two and a half hours we had advanced two more kilometers up that trail, reaching the 2850 m level. This part of the trail is just below a shelter appropriately named *Villosa* Shelter. We reached this point at around 1 p.m. and my upper body was soaked with perspiration despite the mild temperatures. My glasses kept fogging up because the sweat would evaporate off my hot face and condense onto my glasses. We were walking through mist by now, since the clouds had come in upon us. I made the mistake of NOT changing into a dry shirt, and I believe this contributed to my catching a cold.

Once again our guide ventured off the trail down a very steep grade, and found a few gorgeous specimens of *N. villosa*. He beckoned us to follow, and I had to test every step. My guide is considerably smaller and lighter than I am. Just because that rotten log supports his weight does not mean it will support mine! I was holding onto saplings,

roots, anything I could get my hands onto as I descended down that steep grade. I stumbled and slid down the slope a few times. My clothes would have made a great test for a detergent in a TV commercial. Finally, I made it to the plants. There were three of them in reasonable proximity, each was fairly stocky and bush-like and approximately 1 m wide by 1 m tall. The pitchers were beautiful and had the classic shape depicted in popular photographs. They varied in size—some were as tall as 18 cm not counting the lid.

We struggled back up to the trail, and began our descent and search for other *Nepenthes*. After a short distance our guide led us off the trail again to a few plants of *N. kinabaluensis*. These were at least as large as the *N. villosa* we had just seen,



Fig. 2 -- *Nepenthes rajah* in Kinabalu Mountain Garden. Photo by Perry Malouf.

but the pitchers were larger and showed some characteristics of the component *N. rajah*.

Back on the descending trail again, I found that my quadriceps muscles began aching just above my knees. Hiking down requires more care than hiking up, in my opinion, and my muscles were feeling the strain. As we neared the elevation of one of the telecommunications towers, our guide once



Fig. 3-- *N. reinwardtiana* pitcher. Note two "eye dots". Photo by Perry Malouf.



Fig. 4-- *N. tentaculata* (red) pitchers along summit trail. Note nearly white interior. Photo by Perry Malouf.

again led us off the trail. He told us to rest in a clearing while he explored around for more *Nepenthes*. Soon he called us to join him, and we found him in a group of saplings with three very large *N. lowii* vines winding through the branches. These were conservatory specimens if I ever saw any. Each vine was at least 5 m long, and there were pitchers in all stages of development hanging down from the leaf tendrils. Also not far away, in another tall bush, was a *N. tentaculata* with its tendrils coiled around the twigs and forming a cluster of pitchers.

By now the time was nearing 3 p.m., and we had another 2 km of descent to cover before reaching the gate. I was very tired, and the rest of that hike was very gruelling for me. Finally we arrived at the gate, boarded the jalopy, and headed back to the old Administration Building where my basement room beckoned to me. We arrived there at around 5 p.m. as dusk swallowed the mountain. My friend and I consumed a hearty dinner, and I popped an ibuprofen tablet in anticipation of muscle soreness. We were to meet our guide at 8:30 the next morning.

(continued next issue)

Focussing on International CP Conservation and Research:

The Carnivorous Plant Specialist Group

by

Madeleine Groves and Rosemary Simpson

What is the Carnivorous Plant Specialist Group (CPSG) you may well ask and is there a need for yet another carnivorous plant organization?

To answer this question we have to look to the World Conservation Union (IUCN) which is based in Switzerland. Founded in 1948, this is an umbrella organization for the world's conservation agencies, encompassing both governmental and non-governmental organisations. Within IUCN there are a number of Commissions, one of which is the Species Survival Commission (SSC) which is dedicated to conserving species and biological diversity through, amongst other methods, the establishment of "Specialist Groups". The members of these groups help co-ordinate the efforts of numerous agencies and organisations around the world who are dedicated to the conservation and research of a particular plants (e.g. carnivorous plants, cacti, palms, orchids) or animals (e.g. crocodiles, microbats, elephants, otters).

The Carnivorous Plant Specialist Group was established in 1987 by Professor G. Ll. Lucas, (Royal Botanic Gardens, Kew) and was comprised of six members with Dr Martin Cheek (RBG, Kew) acting as Chair until 1994 when he handed over to Bertrand von Arx (Conservation Officer at the Geneva Botanic Garden and Swiss CITES Management Authority). Today the CPSG has 32 members and an extensive list of contacts. Unfortunately it is necessary to restrict the membership to this small number to ensure swift communication but individuals have been chosen to ensure maximum coverage amongst the carnivorous plant community. For example Rick Walker, President of the ICPS is a member of CPSG and through him updates on CPSG's activities can be distributed through CPN and the CP Newsgroup on the Internet.

This brings us to the second question - do we really need another carnivorous plant organisation now? Well, there is an obvious need to improve and co-ordinate

the cp network worldwide as cp populations and their associated habitats continue to be lost. Illegal trade continues and co-operation between conservation agencies and local communities is not always at its best. The CPSG has been established to bring together all these groups and individuals with specialist knowledge in areas such as taxonomy, trade, ecology and propagation together with co-ordinating action to develop conservation and research projects for this group of plants.

The first step of the CPSG is to produce an Action Plan for Carnivorous Plants (see draft below). This will not be another cp coffee table edition or definitive work but rather a summary of the situation for carnivorous plant families worldwide. The Action Plan will focus on presenting recommendations to improve the conservation of these populations and habitats in the future, and, pinpoint new and existing projects. More in-depth supplements to the Action Plan on trade, taxonomy, etc. of these families will be produced in the future. Work on the Action Plan will commence in August 1995. If you are interested in receiving further details please contact the CPSG Secretariat at Fauna and Flora International (FFI), Cambridge*. Keep a look out on the Carnivorous Plant (CP) Database run by Rick Walker on the Internet for requests for information and updates on the Plan's progress.

Another important aspect of CPSG and the Action Plan is to raise funds or institutional/corporate support for and involvement in carnivorous plant projects, an example that should be followed by other cp organisations worldwide. The animal activists have honed their fund-raising skills over the years leaving behind the plant groups. Action for cp conservation needs financial support and a lot of effort and this action is needed now to ensure the long-term survival of cp populations and habitats.

The CPSG also has a newsletter "Carnivorous Plant SG News" produced by Rosemary Simpson** (RBG, Kew). This is circulated to members and contacts. We welcome your support for CPSG and communications are always welcome. Please do not hesitate to contact the CPSG Secretariat if you require further information, have any project suggestions or information for the Action Plan.

Draft Contents of CP Action Plan

The emphasis of this Plan is to stimulate the conservation of carnivorous plants. Thus each section will concentrate on making recommendations and highlighting action points necessary to achieve this goal.

- 1. Preface - a brief outline on the development and structure of the CPSG and the Action Plan, and the roles they will play in future conservation of carnivorous plants.
- 2. Introduction - a brief introduction to carnivorous plants
- 3. Taxonomic groups - a brief overview of the following carnivorous plant families will be given:

Family	Genera
Bromeliaceae	Brocchinia, etc.

Byblidaceae	Byblis
Cephalotaceae	Cephalotus
Dioncophyllaceae	Triphyophyllum
Droseraceae	Aldrovanda, Dionaea, Drosera, Drosophyllum
Lentibulariaceae	Genlisea, Pinguicula, Utricularia
Nepenthaceae	Nepenthes
Sarraceniaceae	Darlingtonia, Heliamphora, Sarracenia

4. Legislation (domestic/international) - each section will cover existing legislation, identify gaps/loopholes.
 - 4.1 Domestic legislation (with subsections by region)
 - 4.2 International legislation
5. Threats - in general
6. Trade (domestic/international) - each section will cover trade practices/trends of past, present and future, identification of the major species in trade and threats of unsustainable trade on populations and habitats
 - 6.1 Domestic trade (with subsections by region)
 - 6.2 International trade
7. Conservation
 - 7.1 In-situ conservation - conservation projects.
 - 7.2 Ex-situ conservation - conservation projects.
8. Propagation - rather than describing in detail every propagation technique available, this chapter will link up with the trade and legislation chapters and concentrate on identifying major propagation projects and their association with conservation.
 - 8.1 Ex-situ propagation projects
 - 8.2 In-situ propagation projects
 - 8.3 Nurseries
 - 8.4 Techniques bibliography
9. Plant/Animal associations
 - 9.1 Major studies - past, present, future.
 - 9.2 Threats
10. Regional Sections - a brief overview of important carnivorous plant regions. These will prove useful when fund-raising within these regions.
11. Education - this section will highlight education projects concerned with carnivorous plants.
12. Proposals for new projects
13. Conclusion
 - 13.1 Summary of major action points
 - 13.2 Code of conduct
14. Bibliography
15. Appendices
 - 15.1 Update on carnivorous plant societies
 - 15.2 Funding
 - 15.2.1 Funding for the CPSG
 - 15.2.2 Action Plan budget
 - 15.2.3 Fund-raising - invitation to all members and contacts to contribute to fund-raising
 - 15.3 CPSG Members and contacts list
 - 15.4 Meetings - regional and international

Addresses to contact are:

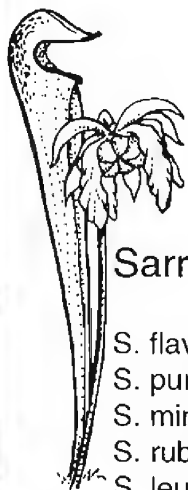
*CPSG Secretariat Madeleine Groves
Fauna and Flora International
Great Eastern House,
Tenison Road
CAMBRIDGE CB1 2DU, UK
Telephone: +44 (0)1223 461 471
Fax: +44 (0)1223 461 481
Email: c/o Rosemary Simpson

**Editor "Carnivorous Plant SG News"

Rosemary Simpson
Conventions and Policy Section
Royal Botanic Gardens, Kew
Richmond, SURREY TW9 3AB, UK
Tel: +44 (0)181 332 5723
Fax: +44 (0)181 332 5757
Email: R.Simpson@rbgkew.org.uk

+Chair Bertrand von Arx

Conservatoire et Jardin botaniques de la Ville de Geneve
C.P. 60
CH-1292 Chambesey, Switzerland
Tel: + 41 (0)22 732 6969
Fax: + 41 (0)22 738 4597
Email: von_Arx@cjb.unige.ch

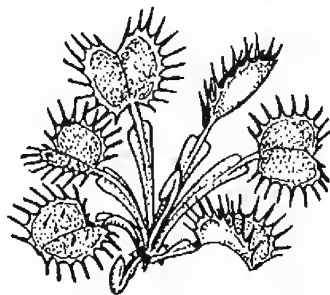


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Drosera praefolia

by

Robert Gibson, P.O. Box 287, Penrith,
N.S.W., 2750, AUSTRALIA



Fig. 1 — *Drosera praefolia*. A plant at the beginning of the flowering season in mid-April. The pedicels, reflexed sepals and immature flowers are an attractive coppery-red to olive-green colour. The foliage bud is just starting to develop but is not visible. Photo by Robert Gibson.

Drosera praefolia is a hysteroanthous, rosetted tuberous *Drosera* endemic to a small area in South Australia. It is an attractive, and easily grown species which has recently been re-instated as a separate species, and has formerly been classified as a variety or subspecies of *D. whittakeri* (Bates, 1991).

In April 1992 I had the good fortune to see this species in the wild not far from Adelaide. Several hundred plants grew in natural woodland on a south-facing slope above a small intermittent creek with other geophytes. Many plants were flowering, which helped in locating the plants. The most distinctive feature of *D. praefolia* is that it flowers before the foliage has developed (i.e. a hysteroanthous habit), which is shared with only one other species, *D. zonaria*, from south-west Western Australia (Lowrie, 1987). The basal rosette develops on the side of the stolon, at the base of the inflorescence and grows rapidly so that by the middle of May the fully grown leaves lie flat on the ground covering many ripening fruit.



Fig. 2 — *Drosera praefolia*. The same plant in late May. Note that the flowers are prostrate in fruit and are variably covered by the rapidly forming rosette. Photo by Robert Gibson.

Another distinctive feature is that the tuber is white, rather than red, and therefore differs from both subspecies of *D. whittakeri*. Other differences are outlined in Bates (1991) and Lowrie (1989).

I collected two mature plants which have grown successfully in cultivation and have allowed me to observe this species throughout its growing season. The red juvenile inflorescence emerges in late March and grows rapidly. The first flower opens within two weeks and the last in the middle of May. Five to twenty

five flowers are born singularly on pedicels 3 to 4 cm long; these lengthen after the flower closes. Each flower lasts only a day and are open from 9:30 am to approximately 4 pm, but the white petals may close later in warmer conditions. The petals smell of nectar, although the flower produces none, which is only detectable (to the human nose) within 10 cm of the open

flower. The scented reflective-white petals are highly visible on the woodland floor and are probably visited by small flies, bees or moths. Each flower becomes prostrate in fruit, and the spherical seeds are shed in June. Non-flowering plants tend to emerge above-ground a few days latter than flowering plants.

The basal rosette starts as a compact red bud at the base of one side of the inflorescence and it begins to open in early May, often before the last flowers have opened. From this point the leaves quickly grow to form a rosette to 50 mm diameter. The leaves are paddle-shaped, to 30 mm long by 12 mm wide with a distinctive, shallowly caniculate petiole to 10 mm long by 2 mm wide. The rounded edge of each leaf appears serrated due to the alternately arranged peripheral down-pointing retentive glands. The leaves have some ability to fold over larger prey and are produced until early July. Those leaves produced from mid-June are on shortened petioles and tend to fill in the gaps in the rosette centre. The leaves grow to 40 mm long, by 16 mm wide, when flowering has finished, and form an attractive rosette to 80 mm diameter. The plants remain bedewed until early September and dies down in late September or early October depending upon soil moisture.

This species grows well in 10-20 cm diameter plastic pots in a mix of approximately 25% peat moss and 75% quartz sand which are kept in a sunny position. The pots are stood in a tray containing water from April to September and also given an occassional sprinkle of water over summer. At present it appears that it can only be propagated from seed, which germinates the following winter (in cultivation). It is necessary to cross-pollinate flowers from separate plants to produce seed. Flowering may be enhanced by fertilizing the plants with dilute potasium sulphate during the growing season.

Daughter rosettes form at the base of the parent plant. From my limited experience, these emanate from the apacices of the often paired scapes, and form if no flower is fertilised.

Drosera praefolia is an attractive, large rosetted tuberous sundew which can be grown successfully under the same conditions as for other tuberous species. Its' hysternanthous habit, attractive white-petalled flowers and leaves makes it an asset in any carnivorous plant collection.

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ACKNOWLEDGEMENTS:

I wish to thank Richard Tilbrooke of Adelaide for showing me this species in the wild.

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Observations on the *Nepenthes* species of Irian Jaya

Part I: *Nepenthes insignis* Danser

by

Heiko Rischer

Kernerstr. 31, 71106 Magstadt, Germany

e-mail: hrischer@rs1.rz.uni-hohenheim.de

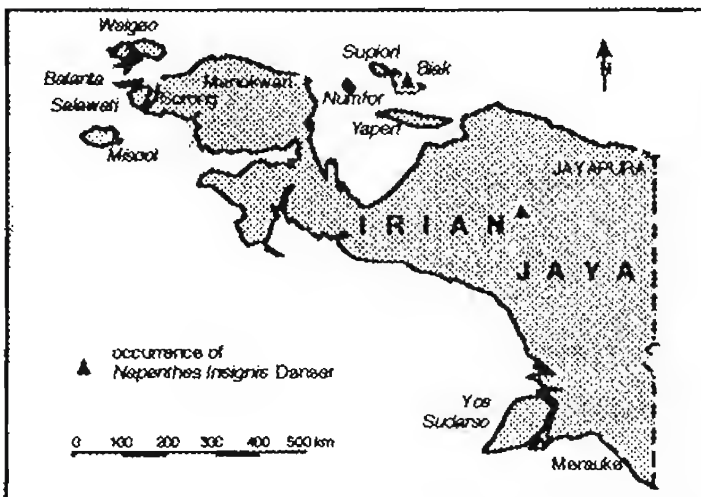
In 1994 a field trip took a group of four people (by name: W. Baumgartl, B. Kistler, H. Rischer, A. Wistuba) to New Guinea, strictly speaking to Irian Jaya. This is the western part of the island, belonging to Indonesia.

Travelling there is very troublesome, because there are not only few roads but also many restricted areas. One needs a special travel permit, too, which is difficult to get. Last but not least one has to be in good form for the tough trekking and the recurrent river-crossings.

The aim of the tour was to find out more about the less known *Nepenthes* species occurring there. In fact most of the species were found - probably because of the extensive previous planning. In a series of articles the findings will be presented.

N. insignis was described in 1928 by Danser using exclusively herbarium specimen. Already in 1912 Pulle collected the type specimen (Pulle 277) and later expeditions brought similar material of the species endemic to New Guinea. It seems that nobody caught sight of a living plant since that time, therefore some things remained obscure e. g. the exact habitat and even the colour of the plant (1 and 2).

Map: *N. insignis* in Irian Jaya:



© by Keppler / Rischer 1995

On this trip the species was found from 115 m alt. in the southern part of the Lake Plains region (restricted area, see also map). The plants grew as epiphytes on high trees and therefore they were easier found along rivers (Fig. 1). They rooted in the thick moss layer covering the trunks. Also in the dense forest single fallen off pitchers pointed out the occurrence in the canopy. Last hints were found in the foothills at about 800 m alt. Here the plants grew in the sediment along the river.

Amazingly all plants found were about the same size i. e. stems were about 50-80 cm long. The lower and upper pitchers were clearly dimorph but both were very huge, up to 30 cm. The lower pitchers were dark green with red spots in the upper part,

with a crinkled brown peristome which was very solid (Fig. 2). In the lower half they were ovoid, in the upper part cylindrical. Contrary to Dansers description two coarsely fringed wings were clearly visible. The shape of the lid was orbiculate to broad cordate, up to 8cm long, the underside often had a redish colour. The upper pitchers were yellowish green with fewer spots but the same brown peristome (Fig. 3). They were infundibulate in the lower part, becoming also cylindrical in the upper part. Below the peristome they had two short wings (up to 3 cm long), sparsely fringed, which continued in two ribs. The lid had the same shape as described above but the colour was green. Another identification character is the decurrent leaf base (for more morphological data see 1).

Only one flowering plant was found. The inflorescence was a raceme with 2-flowered peduncles. The seed was already ripe and germinated in the capsule because of the high humidity caused by a small waterfall.

It was very interesting to see that the prey in the pitchers consisted nearly completely of big winged cockroaches. Presumably these were nocturnal insects - attracted by odour.



Fig. 1. Habitat of *N. insignis* Danser at about 100 m alt. (Lake Plains). Photo by H. Rischer



Fig. 2. Lower pitcher of *N. insignis* Danser. Photo by H. Rischer



Fig. 3. Young upper pitcher of *N. insignis* Danser. Photo by H. Rischer

Sympatric *Nepenthes* species in this area were: *N. ampullaria* Jack; *N. maxima* Reinw. ex Nees (from 400 m! alt. on); *N. mirabilis* (Lour.) Druce (hybrid with *N. insignis* observed at about 500 m alt.); *N. papuana* Dans. ? (determination is doubtful, few plants found at 575 m alt.).

Danser already supposed that *N. insignis* would have a larger distribution - this is proven now. The species could be found on the island of Biak (Cenderawasih Bay) at about sealevel. The plants correspond in all respects but are generally somewhat smaller.

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2. Jebb, M. (1991): An account of *Nepenthes* in New Guinea. Science in New Guinea, 17 (1), 7-54.



Fig. 4. Pitchers of *N. insignis* Danser - an endemic species of New Guinea. Photo by H. Rischer

Want Ads

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Would like to Correspond with fellow *Nepenthes* growers and swap *Nepenthes* seed.

TWO NEW SPECIES OF NEPENTHES FROM NORTH SUMATRA, INDONESIA

by

Bruce R. Salmon, 13 Rothery Road, Manurewa, Auckland 1702, New Zealand
Ricky G. Maulder, 59 Hutchinson Ave, New Lynn, Auckland 1007, New Zealand

SUMMARY

Two new species of *Nepenthes* (Nepenthaceae) from Gunung Pangulubau, North Sumatra, Indonesia are described and illustrated.

INTRODUCTION

In September 1989, while on a *Nepenthes* 'hunting' expedition to Sumatra, fellow traveller, Mike Hopkins and ourselves discovered 3 unique *Nepenthes* species on Gunung Pangulubau in North Sumatra. At the time only photos and plant material of each species was taken for our own private collections. Over the following years it became apparent to us that two of these three species were as yet undescribed. Representative specimens of each species were pressed for posterity and it was not until each species flowered that we felt typification was truly justified. All herbarium specimens and descriptions are from cultivated plants which we feel are reliable enough to be representative of their particular species. These have been deposited at the Auckland Institute and Museum Herbarium, (AK), Auckland, New Zealand.

G. Pangulubau has been climbed several times in the past by various botanists and carnivorous plant enthusiasts. In 1972, S. Kurata (1973:229-231), discovered *N. rhombicaulis* in the subalpine forest on its western slopes at 1700-1900m. More recently, *N. ovata* Nerz et Wistuba (1994:108-111), was described from a similar altitude and is one of the three unique species we saw on our expedition. Considering the relatively small area of G. Pangulubau, it seems remarkable that successive new *Nepenthes* species should reveal themselves to some explorers but remain undiscovered by those who journeyed there previously.

***Nepenthes xiphioides* Salmon et Maulder spec. nov.**

Folia rosularum coriacea, semi-amplexicaulia, lanceolata, 40-50mm longa, 10-15mm lata, obtusa vel acuminata ad apicem, auriculata ad basim, sine vagina. Venae pennatae, irregulariter reticulatae; venae longitudinales 2 vel 3 utrinque, in laminae dimidio exteriori currentes; cirrhus tenuis, folio 2-3plo longior. Folia radicum brevium 140mm longa, 40mm lata. Folia caulis scandentis foliis rosulae similia, 70-120mm longa, 15-30mm lata; cirrhi longitudinem foliorum aequantes, ascidiis nullis. Ascidia rosularum et brachyblastorum, 40-55mm celsa, 15-20mm lata, ovata-ellipsoidea in $\frac{2}{5}$ inferioribus, parum decrescentia sub ore, ellipsoidea super partem angustam, duobus alis fimbriatis per longitudinem totam. Alae 1-2mm latae, segmenta fimbriarum filiformia, 2-4mm longae; os obliquissimum, ovatum, acuescens versus operculum; peristomium rotundatum, 1.5-2mm latum antice, complanescens et ibi latissimum, 2.5-3.5mm in $\frac{1}{3}$ superiore costis 0.3-0.6mm distantibus, 6-8plo longioribus quam latis, pectinatum; ascidii pagina interior, glandulosa in $\frac{2}{3}$ inferioribus, glandibus minutis superfornicatis ellipticis vel rotundis, in $\frac{1}{3}$ superiore pruinosis absque glandibus. Ascidii operculum ovatum, 10-20mm longum, 8-15mm latum, cordatum ad basim, rotundatum ad apicem, pagina inferiore glandulosa glandibus ellipticis vel rotundis, profundis, margine praeditis; nervus centralis ut maximum obtuse carinatus, calcar filiforme, complanatum, 1-2mm longum. Ascidia caulis scandentis nulla. Inflorescentia mascula racemus rectus 135-220mm longus floribus 45-70; pedicelli uniflori sed cum nonnullis pedicellis bifloribus in $\frac{1}{3}$ inferiore, 3-14mm longi. Tepala ovata et reflexa; indumentum rarissimum in partibus maturis, caulibus et foliis glabris; ascidia capillis brevibus dendriticis et stellatis tecta. Operculi capilli in superiore et inferiore paginis,

stellati. Pedunculi superior pars, axis, pedicelli, tepali margines capillis brevibus appressis filiformibus teguntur; tepali pagina exterior et columna staminalis glabrae. **Holotypus:** B. Salmon & R. Maulder, 221720, vine with male inflorescence, lower pitcher, rosette with pitchers. N. Sumatra, East side of Lake Toba, Gunung Pangulubau, 1900m alt., 17. Feb. 1995(AK).

Stems, prostrate or climbing, up to 2m long, cylindrical 4-5mm wide with many small rosettes and short shoots at the base, sometimes adventitious underground stems produce rosettes away from the main plant; internodes 20-40mm long. Leaves of the rosettes, coriaceous, semi-amplexicaul, lanceolate 40-50mm long, 10-15 mm wide, obtuse to acuminate at the apex, auriculate at the base clasping the stem for $\frac{2}{3}$ the diameter. Pennate veins, irregularly reticulate, running obliquely to the margin; longitudinal veins, 2 or 3 on each side, running in the outer $\frac{1}{2}$ of the blade; originating from the midrib near the base of the leaf, converging at the tip. Tendril, slender 1.5mm wide, 2-3 X as long as the leaf, descending without curl. Leaves of the short shoots often larger than those of the rosette and climbing stem, 140mm long, 40mm wide. Leaves of the climbing stem similar to those of the rosette, 70-120mm long, 15-30mm wide; leaves tending to reduce in size as the stem grows longer. Tendrils the same length as the leaves, slender, 1mm wide, straight without curl and bearing no pitchers. Pitchers of the rosettes, abruptly incurved at the front or side from the hanging end of the tendril, 40-55mm tall, 15-20mm wide, ovate-ellipsoidal in the lower $\frac{2}{5}$ narrowing slightly about 5mm below the mouth, ellipsoidal at the back and above the narrow part with 2 fringed wings over the entire length. Wings 1-2mm wide, fringe segments filiform, 2-4mm long, and 8-14 fringe segments per cm. Mouth, very oblique, elevated towards the lid, ovate becoming acute towards the lid with almost no neck; peristome, rounded 1.5-2mm wide in front becoming flattened and widest, 2.5-3.5mm in the upper $\frac{1}{3}$ with ribs 0.3-0.6mm apart, 6-8 X as long as wide on the inner margin, pectinate. Inner surface of the pitcher, glandular in the lower $\frac{2}{3}$ with minute elliptic to rotund overarched glands 0.15-0.3mm long, the long axis of the glands orientated at right angles to the long axis of the pitcher; from the bottom to the top 400-600 glands per cm², glands becoming larger and more rotund towards the bottom of the pitcher; the upper $\frac{1}{3}$ glandless and pruinose. Pitcher lid, ovate 10-20mm long, 8-15mm wide, cordate at the base, rounded at the apex, the lower surface glandular, with elliptic to rotund, deepened and rimmed glands 0.1-0.4mm long, the long axis of the glands orientated with the long axis of the lid; midrib at most obtusely carinate, the glands situated on either side becoming more concentrated towards the base with a glandless band around the margin of the lid; spur filiform, flattened 1-2mm long, singular or forked once, inserted at the base of the lid. Pitchers of the short shoots, similar to those of the rosette. Pitchers of the climbing stem, non-existent. Male inflorescence an erect raceme, peduncle cylindrical 45-80mm long, 3.5-5mm wide; axis, slightly angular, gradually tapering towards the tip 90-140mm long bearing approximately 45-70 flowers; pedicels, situated in one whorl and an apical group, 1 flowered but bearing some 2 flowered pedicels in the lower $\frac{1}{3}$ with a 1-4mm long bract at their base; bracts becoming smaller towards the axis tip. Inter-pedicel length 4-9mm; single flowered pedicel bases 1mm broad, 3mm long near the top of the axis, 14mm long near the bottom; 2 flowered bases 1-1.5mm broad, 2-3mm long; arms 5-7mm long. Tepals ovate and cupped 3-3.5mm long, 2-2.5mm wide, reflexed; inner surface glandular, glands elliptic to rotund 0.1-0.25mm long, the long axis of the glands orientated with the long axis of the tepal; staminal column including the anther 3.5-5.5mm long, the shorter staminal columns near the top of the axis. Female inflorescence, unknown. Indumentum, very sparse on mature parts, the stems and leaves glabrous; tendrils glabrous becoming slightly hairy towards their tips. Immature pitchers covered with short filiform, tomentose hairs; mature pitchers retain these hairs which are abundantly

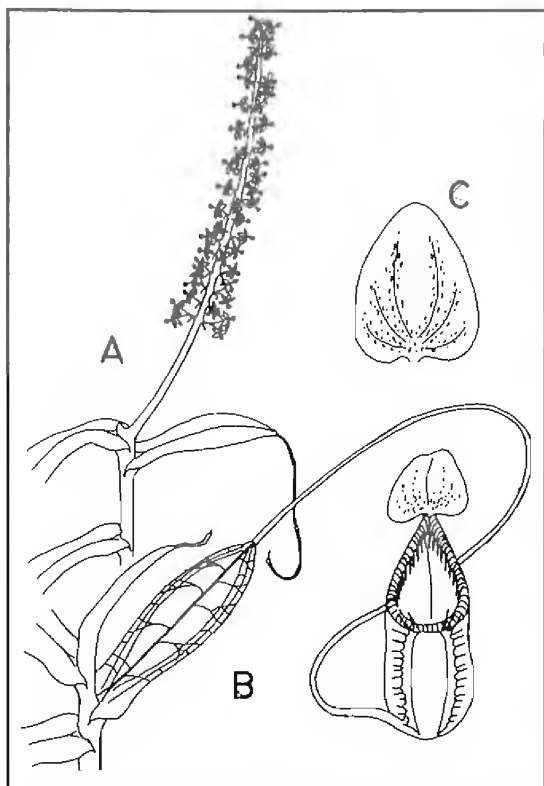


Fig. 1 -- *Nepenthes xiphioides* sp. nov. A. Male inflorescence. B. Rosette of leaves and anterior view of lower pitcher. C. Lower surface of lid. See article in this issue



Fig. 2 -- *Nepenthes xiphioides* sp. nov. Plant in cultivation. See article in this issue

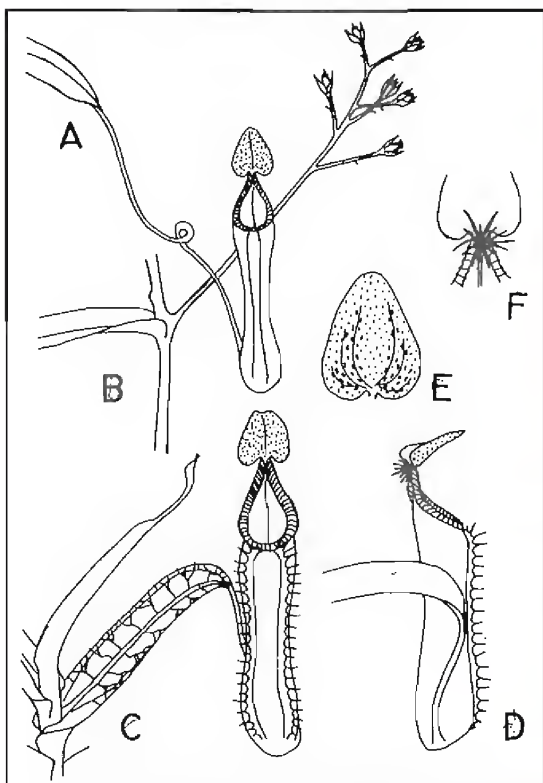


Fig. 3 -- *Nepenthes mikei* sp. nov. A. Upper pitcher. B. Female inflorescence. C. Lower pitcher and leaf anterior view. D. Lower pitcher lateral view. E. Lower surface of lid. F. Detail of lower pitcher spur posterior view. See article in this issue



Fig. 4 -- *Nepenthes mikei* sp. nov. Cultivated plant. See article in this issue

scattered over its entirety; the hairs are of 2 types, dendritic 0.8mm long and stellate 0.3mm long. Lid hairs on both upper and lower surfaces, stellate 0.05-0.1mm long; longest and most concentrated near the ribs. The upper part of the peduncle, axis, pedicels and tepal margins covered with short appressed filiform hairs 0.2-0.5mm long; outer surface of tepal and staminal column glabrous.

Colour: Colour of herbarium specimens: Light brown. Colour of living specimens: Stems dull red; leaves, glossy green above, lighter below; midrib of lower leaves, dull red above and below; midrib of upper leaves, dull red above, yellowish green below; tendrils green to reddish yellow. The rosette pitchers, yellow or green with dull red markings outside; the inner surface, yellowish green in the glandular part, purple in the pruinose part; peristome, yellow, sometimes tinged with red; lid, yellow with red markings above, light yellow below. Inflorescence, yellowish green. Indumentum, brownish.

Distribution:

North Sumatra, Indonesia, Gunung Pangulubau, 1800-1900m altitude.

Ecology:

First discovered in September 1989, this species was observed and collected from wet mossy forest on a very steep ridge near the top of G. Pangulubau, a high peak in the range of mountains on the Eastern side of Lake Toba, North Sumatra. The plants were growing in peaty humus or moss in a very open and exposed position, characterized by stunted trees only a few metres tall. Plants were either prostrate or climbing up the trees and shrubs but not more than 2m. Most plants had many rosettes or short shoots at their base. Adventitious, underground stems also produced rosettes away from the main plant. Plants were found flowering when only 30cm tall and all climbing stems lacked upper pitchers. *N. xiphioides* spec. nov. formed natural hybrids with *N. ovata* and *N. miki* spec. nov. Although *N. xiphioides* spec. nov. was only found at this one location, it is most likely to occur in other suitable habitats along this mountain range, to which it is probably endemic.

Derivation:

The specific epithet *xiphioides*, from the Latin (*xiph*) a sword and (*oides*) resembling; refers to the long, thin teeth of the inner margin of the peristome. It has been known to a few growers as *N. rancing* nom. nud., which is the Indonesian equivalent of its Latin name. The name *N. rancing* nom. nud. has never been published, therefore it is invalid.

Notes:

Although no single feature of this new taxon is diagnostic, the combination of features are unique. Specifically the consistently small size of the pitchers, the length of the teeth on the inner margin of the peristome, the absence of aerial pitchers and the long tendrils of the rosette leaves. These features and its geographical isolation from other known populations of *N. gymnamphora*, clearly distinguishes this species from *N. gymnamphora*. After comparing *N. xiphioides* spec. nov. with three live specimens of *N. gymnamphora*, one from G. Telaga in Java and the other two from G. Tanggamus and G. Talang in Sumatra, the following differences were noted and are set out in Table 1. Descriptions of *N. gymnamphora*, Danser, 1928:(300-306) and *N. melamphora*, Macfarlane 1908:(56-57) were also taken into account.

Table 1.

Characteristics of *N. xiphioides* spec. nov. compared to its nearest relative *N. gymnamphora*.

	<i>N. xiphioides</i>	<i>N. gymnamphora</i>
Longitudinal leaf veins	2-3 running in outer $\frac{1}{2}$ of blade	3-6 running in outer $\frac{2}{3}$ - $\frac{4}{5}$ of blade
Leaf margins	glabrous	covered with short dense hair
Rosette leaf tendril	2-3 X as long as the leaf	about as long as the pitcher
Rosette pitchers	4-5.5cm tall 1.5-2cm broad	8-12cm tall 3-4cm broad
Aerial pitchers	absent	present*
Peristome teeth	6-8 X as long as broad	3-6 X as long as broad
Inflorescence	1 flowered but bearing some 2 flowered pedicels in lower $\frac{1}{3}$	mostly 2 flowered, upper most ones 1 flowered; rarely most or all of them 1 flowered
Staminal column	glabrous	hairy at base or over whole length

* From personal experience, *N. gymnamphora* forms from West Sumatra are less likely to have upper pitchers than those forms from Java.

Specimens examined:

Nepenthes xiphioides: B. Salmon & R. Maulder, 221720 (Holotype), vine with male inflorescence, lower pitcher, rosette with pitchers. N. Sumatra, East side of Lake Toba, Gunung Pangulubau, 1900m alt., 17.Feb.1995 (AK).

Nepenthes miki Salmon et Maulder spec. nov.

Folia rosularum coriacea, sessilia, linearia, 50-70mm longa, 9-12mm lata, obtusa ad apicem, abrupte contracta ad basim, sine vagina. Venae pennatae irregulariter reticulatae; venae longitudinales 1 vel 2 utrinque, in laminae dimidio exteriori currentes; cirrhi tenues, folii longitudinem aequantes. Folia caulis scandentis foliis rosulae similia; cirrhi $1\frac{1}{2}$ -2plo longiores quam folium, simpliciter crispatis. Ascidia rosularum, 60-80mm longa, 10-20mm lata, a fronte angustissima, ovata-ellipsoidea in $\frac{1}{3}$ inferiore, in media parte decrescentia ad formam tubi, infundibuliformia in $\frac{1}{3}$ superiore, parum decrescentia versus os 2 alis fimbriatis per totam longitudinem currentibus. Alae 1-2mm latae, marginis segmenta filiformia, 1-2mm longa; os obliquum, ovatum, parum acuescens versus operculum; peristomium rotundatum, 1-1.5mm latum antice, 2.5-3.5mm latum versus operculum; costae 0.2-0.4mm distantes, tam longae quam latae; ascidii pagina interior glandulosa in $\frac{1}{4}$ inferiore glandibus minutis rotundis elevatis et convexis, in $\frac{3}{4}$ superioribus pruinosa glandulis nullis. Ascidii operculum ovatum, 10-20mm longum, 8-18mm latum, reniforme ad basim, rotundum ad apicem; pagina inferior glandulosa glandibus minutis rotundis elatis convexis; nervus centralis ut maximum obtuse carinatus. Calcar fasciculatum, segmentis usque ad 12, 3-7mm longum. Ascidia caulis scandentis omnino minora; alae ad costas redactae, nullis appendicibus filiformibus; calcar bis vel ter ramosum, 4-6mm longum. Inflorescentia feminea racemus semi-horizontalis; pedicelli uniflori 4-10 floribus, 6-15mm longi. Tepala lanceolata non late patentia; indumentum rarissimum in partibus maturis, caulibus et foliis glabris; cirrhi et ascidia capillis brevibus filiformibus dendriticis stellatis tecta. Operculi capilli stellati, profusi in pagina superiore, pagina inferior glabra; pedunculus, pedicelli, tepali margines, ovarium capillis brevibus filiformibus appressis tecta; tepalorum pagina exterior glabra et verrucosa.

Holotypus: B. Salmon & R. Maulder, 221719, vine with female inflorescence, lower pitcher, rosette. N. Sumatra, East side of Lake Toba, Gunung Pangulubau, 2000m alt., 17.Feb.1995(AK).

Stems; climbing, up to 7m long, cylindrical, 2-3mm broad with a few rosettes and short shoots at the base, occasionally branching in the woody parts, beginning with small rosettes which eventually become shoots; internodes, 50-90mm long. Leaves of the rosettes, coriaceous, sessile, linear, 50-70mm long, 9-12mm wide, obtuse at the apex, abruptly contracted at the base clasping the stem for $\frac{1}{2}$ the diameter. Pennate veins irregularly reticulate, running obliquely to the margin; longitudinal veins, 1 or 2 on each side, running in the outer $\frac{1}{2}$ of the blade; originating from the midrib near the base of the leaf converging at the tip. Tendrils, slender, 1-1.5mm wide, approximately the same length as the leaf, descending without curl. Leaves of the short shoots, similar to those of the rosette. Leaves of the climbing stem, similar to those of the rosette; tendrils, $1\frac{1}{2}$ -2 X as long as the leaf, bearing pitchers with a simple curl. Pitchers of the rosettes, abruptly incurved at the front or side from the hanging end of the tendril, 60-80mm long, 10-20mm wide, narrowest from the front, ovate-ellipsoidal in the lower $\frac{1}{3}$, narrowing in the central part to become tubular, infundibuliform in the upper $\frac{1}{3}$, narrowing slightly towards the mouth with 2 fringed wings running the entire length. Wings, 1-2mm wide, fringe segments filiform, 1-2mm long and 4-8 fringe segments per cm. Mouth, oblique, elevated towards the lid, ovate becoming slightly acute towards the lid with almost no neck; peristome, rounded, 1-1.5mm wide in front, 2.5-3.5mm wide near the lid; ribs, 0.2-0.4mm apart, as long as wide on the inner margin; inner surface of the pitcher, glandular in the lower $\frac{1}{4}$ with minute raised and convex, rotund glands, 0.2-0.3mm long; from the bottom to the top about 150-180 glands per cm² glands becoming larger and fewer towards the bottom with the upper $\frac{3}{4}$ glandless and pruinose. Pitcher lid, ovate 10-20mm long, 8-18mm wide, reniform at the base, rounded at the apex; the lower surface glandular with minute raised and convex, rotund glands, 0.1-0.2mm long, evenly distributed over the entire surface, approximately 40 per cm²; the midrib at most obtusely carinate. Spur, fasciculate, up to 12 segments, 3-7mm long, inserted at the base of the lid. Pitchers of the short shoots, similar to those of the rosette, abruptly incurved at the side from the hanging end of the tendril, facing outwards from the stem. Pitchers of the climbing stem, similar to those of the rosette and short shoots but generally slightly smaller in all respects; gradually incurved at the back from the hanging end of the tendril with a 2.5-3.5mm curve; wings reduced to ribs, 0.5mm wide with no filiform appendages; spur, branched 2-3 times, 4-6mm long. Male inflorescence, unknown. Female inflorescence, a semi-horizontal raceme; peduncle, cylindrical, 25-45mm long, 0.8-1.2mm wide; axis gradually tapering towards the tip, 15-35mm long bearing approximately 4-10 flowers. Pedicels situated in a whorl, 1 flowered with a 1-1.5mm long bract protruding from about $\frac{1}{2}$ way up the pedicel; inter- pedicel length 3-9mm; pedicel bases, 0.5-1mm broad, 6mm long near the top of the axis, 15mm long near the bottom. Tepals, lanceolate, cupped, 3-4mm long, 1-1.5mm wide, not opening widely; inner surface glandular, glands elliptic to rotund, 0.1mm long, the long axis of the glands being orientated with the long axis of the tepal; stigma 3.5-4mm long, 1.5-2mm wide being shortest near the top of the axis. Indumentum very sparse on mature parts, the stems and leaves glabrous; tendrils covered with filiform to dendritic hairs, 0.2-0.5mm long; immature pitchers covered with short filiform, tomentose hairs; mature pitchers retain these hairs which are abundantly scattered over its entirety. The hairs are of 2 types; filiform to dendritic hairs, 0.4-0.7mm long, which are quite sparse, and stellate hairs, 0.05-0.1mm long which are profuse over the pitcher surface. Lid hairs, profuse on the upper surface, lower surface glabrous; stellate, 0.05-0.1mm long, longest and most concentrated near the ribs; spur also with short dendritic and stellate hairs. The peduncle, pedicels, tepal margins and ovary covered with short filiform appressed hairs, 0.05-0.3mm long; outer surface of tepals, glabrous and warty.

Colour: Colour of herbarium specimens: Blackish. Colour of living specimens. Stems,

blackish; leaves, glossy green above, lighter below; midrib green; tendrils blackish. Rosette pitchers, yellowish green heavily marked with black outside; inner surface, green in the glandular part, whitish green in the pruinose part; lid, yellowish green with black markings above, green below; peristome, green to yellowish green, sometimes tinged with black. Upper pitchers similar to lowers. Inflorescence, blackish. Indumentum, white.

Distribution:

North Sumatra, Indonesia, Gunung Pangulubau, 1900-2000m altitude.

Ecology:

First discovered in September 1989, this species was observed and collected from a very steep ridge in wet mossy forest near the top of G. Pangulubau, a high peak in the range of mountains on the Eastern side of Lake Toba, North Sumatra. The plants were growing in peaty humus or moss at the base of 5-6m tall trees, in association with other *Nepenthes* species; *N. ovata*, *N. spectabilis* and *N. xiphioides* spec. nov. Numerous natural hybrids occurred between all four. *N. xiphioides* spec. nov. grew in the open in an adjacent habitat while *N. rhombicaulis* grew in denser forest 100m lower. *N. mikei* spec. nov. bears little resemblance to any of these species so is therefore unlikely to be a hybrid. Although this new taxon was only found at this one location, it is likely to occur throughout this mountain range in other suitable habitats, and is probably endemic to this area.

Derivation:

The specific epithet *Mikei* refers to the late Mike Hopkins. This new taxon is named in his honour as he accompanied us on a number of expeditions to S. E. Asia and was a co-discoverer of this species. *N. mikei* spec. nov. has been known to a few growers as *N. minutissima* nom. nud. but this name was never published so it is invalid.

Notes:

Nepenthes mikei spec. nov. is very clearly distinct from the related species, *N. tobaica*, *N. tentaculata* and *N. adnata*. It is most easily recognized by the fasciculate spur on the lower pitchers.

Table 2.

Characteristics of *N. mikei* spec. nov. compared to related species.

	N. mikei	N. tobaica	N. tentaculata	N. adnata
Leaf base	abruptly contracted	rounded or slightly amplexicaul	very oblique almost decurrent, cordate	shortly decurrent
Longitudinal leaf veins	1 or 2 running in outer 1/2 of blade	sometimes 1, rarely 2	2-8 usually 4 running in outer 2/3 - 3/4 of blade	3-4 on each side
Spur	fasciculate, lowers branched 2-3 X, uppers	filiform, not branched	flattened, not branched	—
Inflorescence	1 flowered	2 flowered	1 flowered	1 flowered
Pediceal bract	half way up pedicel	bracts absent	bracts absent	—

Specimens examined:

Nepenthes mikei: B. Salmon & R. Maulder, 221719 (Holotype), vine with female inflorescence, lower pitcher, rosette. N. Sumatra, East side of Lake Toba, Gunung

Pangulubau, 2000m alt., 17.Feb.1995 (AK); *N. miki*: B. Salmon & R. Maulder, 221718, two upper pitchers, short shoot with pitchers, two lower pitchers. N. Sumatra, East side of Lake Toba, G. Pangulubau, 2000m alt., 17.Feb.1995 (AK).

Acknowledgements:

We would like to thank Ewen Cameron and the staff of the Auckland Institute and Museum Herbarium for their help with preparation of specimens and Dr. Will Richardson from the University of Auckland Classics Department for his Latin translation of our descriptions.

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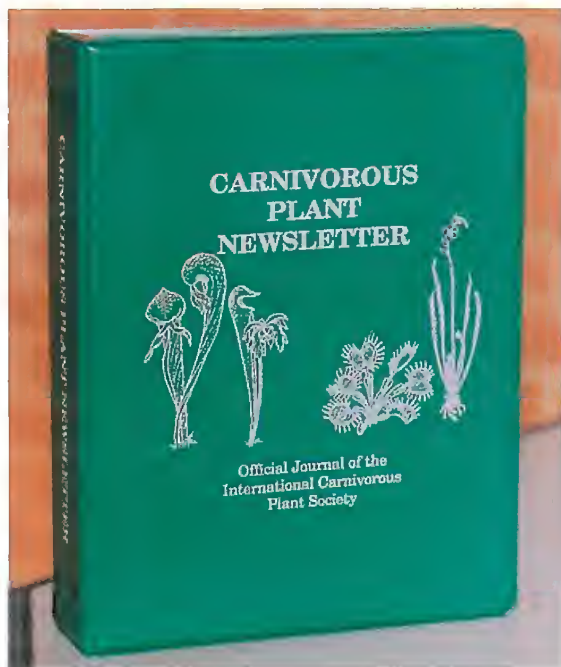
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A Guide to ESA and CITES

by

Christoph A. Belanger, 88 Strathmore Rd. #4, Brookline, MA 02146
email: cbelan9630@aol.com

Many insectivorous plant horticulturists are very confused about the Federal Regulations under the ESA and CITES. The fact that there are two different sets of rules compounds the issue even more. This confusion and the recent incident in California has resulted in widespread fear of U.S. authorities and general paranoia. The purpose of this article is to alleviate this fear and educate the members of ICPS. I will discuss and outline the procedures mandated by the Endangered Species Act. Then I will elucidate CITES and, finally, talk about a means to import plants into the U.S.

I. U.S. Regulations As Defined in 50 CFR Part 17 Implementing the Endangered Species Act

A. For The Purposes Of These Regulations The Following Plants Are Endangered

This applies equally to live or dead plants, their seed (except in the case of a threatened species), and parts or products derived from them.

Scientific Name*	Common Name*	Status*
Sarracenia S. oreophilla S. rubra ssp. alabamensis S. rubra ssp. jonesii	Green Pitcher Plant Canebrake Pitcher Plant Mountain Sweet Pitcher Plant	Endangered Endangered Endangered
Pinguicula Pinguicula ionantha	Godfrey's Butterwort	Threatened

*adapted from 50 CFR 17.12

B. Prohibited Acts Under 50 CFR 17.61

- Σ Import and export. This includes any shipment in transit through the United States whether or not it has entered the United States for customs purposes.
- Σ Removing plants from their habitats and placing them into collections.
- Σ It is prohibited to deliver, receive, carry, transport or ship an endangered plant in interstate or foreign commerce by any means and in the course of a commercial activity.
- Σ It is prohibited to sell or offer an endangered plant for sale. However, it is permissible to advertise for sale an endangered plant, as long as there is a warning that no sale may be communicated until a permit has been obtained from the U.S. Fish and Wildlife Service (F&WS).

C. Special Permits

1. Permits For Scientific Purposes Or For The Enhancement Of Propagation Or Survival

Permits for scientific purposes or for the enhancement of propagation may be obtained under 50 CFR 17.62. Upon receipt of a complete application a permit may be issued authorizing any activity otherwise prohibited by §17.61.

2. Economic Hardship Permits

Under 50 CFR 17.63, permits for economic hardship may be granted. The exemption will not be granted for the import or export of a species also listed under Appendix I (to be defined later) of the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora, if the species would be used in a commercial activity. An application for this type of permit must be submitted to F&WS by the person allegedly suffering excessive economic hardship if the applicant's desired activity is prohibited under §17.61.

3. Address For The Above Permits

U.S. Department of the Interior
Office of Management Authority
U.S. Fish and Wildlife Service
4401 N. Fairfax Dr., Rm. 420c
Arlington, VA 22203

Phone (800) 358-2104

4. Other Special Permits

In addition to the above permits, there is also a **Native Endangered and Threatened Plant Interstate Commerce Permit**. The underlying message of this commercial permit is the clear emphasis on the enhancement of species survival. When the vendor ships the plants the containers must be plainly marked with accurate descriptions. The scientific name, whether it is artificially propagated or wild collected, and the permit number of the U.S. Fish and Wildlife permit must be plainly visible. The permit also encourages the disbursement of educational information on the particular species being sold. Further, the agency also requires that an annual report be submitted. This report must include, for wild collected plants a complete listing of activities; and for propagated plants, the number of plants produced, the number sold, and the names and addresses of the people who purchased such plants. The application for this permit may be obtained from the following address:

U.S. Department of the Interior
Office of Management Authority
U.S. Fish and Wildlife Service
1875 Century Blvd.
Atlanta, GA 30345

D. Some Additional Notes

According to the literature, the plants stated above are the only plants that are protected under the ESA. The other *Sarraceniae*, *Dionaea*, and *Darlingtonia* are not listed as endangered, hence, the rules do not apply - yet. However, a proposal has been submitted to place the following species under protection: *Dionaea muscipula*, *Pinguicula planifolia*, *Sarracenia leucophylla*, and *S. rubra* ssp. *wherryi*. It should be emphasized that the regulations above pertain only to the United States and its territories. People residing in other countries should consult with their proper authorities for the appropriate permits. The regulations only pertain to species specifically listed in 50 CFR 17.12, and do not apply to such species as *N. rajah* and *N. khasiana*. These are, however, subject to CITES.

As tissue culture is not mentioned in any of the materials that I obtained from the U.S. F&WS, I recommend the rules and regulations mentioned above be followed to avoid any sort of problems.

In addition to these regulations, individual states have their own regulations. Check with the appropriate states if you want to engage in commercial trade and collection of plants in your state.

II. Convention on International Trade on Endangered Species (CITES)

A. For Purposes Of Explaining Regulation The Following Species Are Listed In CITES

Species*	Common Name*	Appendix*	Date Listed*
Family <i>Byblidaceae</i> <i>Byblis</i> ssp. #1	Byblis family Byblis, Rainbowplants	II	6/28/79
Family <i>Cephalotacea</i> <i>Cephalotus follicularis</i> #1	eustralian pitcher plant family Western Australian pitcher plant	II	6/28/79
Family <i>Droseraceae</i> <i>Dionaea muscipula</i> #1	Sundew family Venus flytrap	II	6/11/92
Family <i>Nepenthaceae</i> <i>N. rajah</i> <i>N. khasiana</i> <i>Nepenthes</i> ssp. (all except those in Appendix I) #1	Old world pitcher plant family Giant tropical pitcher plant Indian tropical pitcher plant Tropical pitcher plants	I I II	6/06/81 10/22/87 10/22/87
Family <i>Sarraceniaceae</i> <i>Darlingtonia californica</i> #1	New World pitcher plant family Cobra lily	II	6/06/81
<i>Sarracenia oreophila</i>	Green Pitcher Plant	I	6/06/81
<i>Sarracenia rubra alabamensis</i>	Canebrake Pitcher Plant	I	6/06/81
<i>Sarracenia rubra jonesii</i>	Mountain Sweet Pitcher Plant	I	6/06/81
<i>Sarracenia</i> sp. (all except those listed in Appendix I) #1	Trumpet pitcher plants	II	10/22/87

*adapted from 50 CFR §23.23

B. Appendix I

Appendix I includes species presently threatened with extinction and, therefore, the Convention's controls are directed at these species. Plants listed as **Appendix I**, intended for importation into the United States, must have two permits - a CITES import permit as well as a CITES export permit from the country of origin. Permits are granted only when the import or export will not be detrimental to the survival of the species.

C. Appendix II

Appendix II species are not presently threatened with extinction but may become so unless their trade is regulated. Plants listed as **Appendix II**, intended for importation into the United States do not require an import permit but do require an export permit of the country of origin.

The symbol #1 placed against the name of a species or higher taxon included in Appendix II indicates that seed, pollen, tissue cultures, and flasket seedling cultures are exempt from CITES under Article I of the Convention.

D. Certificates of Exemption

Several certificates of exemption are available. The Pre-Convention Certificate exempts species that were obtained prior to its date of listing under the Convention. In addition, there is also a Captive-Bred Certificate for Artificially Propagated Plants if the species meets the criteria for bred in captivity or artificially propagated as set forth in CITES Conf. 2.12 or 8.17. Lastly, a Scientific Exchange Certificate may be issued to scientific institutions that are eligible for this certificate which authorizes import and export of museum and herbarium specimens.

E. Address for CITES Permit

United States Department of the Interior
Office of the Management Authority
U.S. Fish and Wildlife Service
4401 N. Fairfax Dr., Rm. 420c
Arlington VA 22203

Phone (800) 358-2104

F. Some Additional Notes

The laws for plants protected under CITES are quite different from the laws under the ESA and care must be taken not to confuse the two, particularly when it comes to the plants each law protects. As it stands today, anyone wishing to engage in international trade of CITES protected plants must wait 90 days to find out if the application was accepted. Further, the individual will have to allow the inspection of the premises where the plants are grown and provide detailed information on all plants.

III. United States Department of Agriculture Import Permit

Regardless of whether or not an individual wishes to import CITES protected plants it is necessary to obtain an import permit from the United States Department of Agriculture before importation. The process of obtaining a U.S.D.A. import permit is much simpler than the process of obtaining a CITES permit or an ESA permit. Listed below are some of the requirements in order to obtain such a permit.

A. Purpose

The purpose of such a permit is to prevent the accidental introduction of injurious plants (weed), insects, and fungi. For this reason, each time an individual wishes to import plants from a foreign country it is necessary to obtain a Phytosanitary Certificate declaring the plants free from pests and diseases.

B. Application Procedure

After the receipt of the an application from the U.S.D.A., the following information must be submitted in the application: Name, address, and telephone number of the importer; approximate quantity and kinds (botanical designation) of articles intended to be imported; countries or localities where grown; intended United States port of arrival; means of transportation, e.g. mail, airmail, express, air express, freight, air freight, or baggage; and expected date of arrival. After receipt and review of the application, a written permit indicating the conditions for importation will be issued. If plants are intended to be imported by mail or air mail Green-and -Yellow Labels will also be issued. These are labels that must be affixed on the outside of the parcel and directs the package to the nearest designated port of entry, such as New York JFK Airport or Miami. There the inspector examines the plants and it is determined if emergency measures need to be taken.

C. Plant Importation Procedures And Responsibilities Of Plant Importers

There are several basic requirements that must be communicated to the foreign shipper, some of which are listed below:

- Σ **Freedom from Soil.** Plants arriving in, or contaminated with sand, soil, or earth will be refused entry.
- Σ **Packing material.** The following are approved packing materials: ground peat, sphagnum, pulp-free coconut or other vegetable fibers, osmunda fiber, excelsior, wood shavings, sawdust, ground cork, buckwheat hulls, polymer stabilized cellulose, and exfoliated vermiculite.
- Σ **Size-age limitations.** Plants grown from cuttings or seed which are more than two years of age will not be admitted.
- Σ **Labeling.** All material must be clearly labeled with genus, species, and variety.
- Σ **Invoices for importations by mail.** One copy of the invoice must be enclosed within the parcel or within one of the parcels in the event of a lot shipment.

- Σ **Certification for importations by mail.** A copy of the phytosanitary certificate must be attached to the outside of each parcel, and the original certificate must be enclosed within the parcel or within one of the parcels in the event of a lot shipment.
- Σ **Means of importation.** The importer may import material either by mail or freight and should instruct the foreign shipper of the appropriate shipping method. It should be mentioned that mail shipments require the use of a GREEN-AND-YELLOW LABEL (available at the time of application).

There are a few other requirements as well, but the ones listed above are the most important ones. Anyone, wishing to import plant material should read the literature carefully.

D. Address

U.S. Department of Agriculture
APHIS-PPQ
Port Operations Permit Unit
4700 River Road, Unit 136
Riverdale, MD 20737-1236

Phone (301) 734-8645
Fax (301) 734-5786

IV. Conclusion

The regulations as they are written are relatively straightforward and easy to understand. However, the bureaucracy of the agencies that implement and enforce these regulations complicates the situation for many reasons. I will detail these problems in another article, since the primary purpose of this article is to educate members of ICPS and not to criticize the agencies involved.

To conclude and reiterate, this article is meant to be a guide to the members of ICPS. If they wish to engage in trading endangered plants or send plants overseas, members need to contact the appropriate agencies.

Acknowledgment

I would like to sincerely thank Rob Sacilotto for telling me about the Native Endangered and Threatened Plant Interstate Commerce Permit. He told me the permit is not well known even in Washington, DC, and now, through his persistence, the opportunity of selling or buying endangered species exists.

One Last Thing...

If anyone has any comments I would be more than happy to hear from you.

Utricularia asplundii and Utricularia endresii

by

Christoph A. Belanger, 88 Strathmore Rd, Apt.#4, Brookline, MA 02146

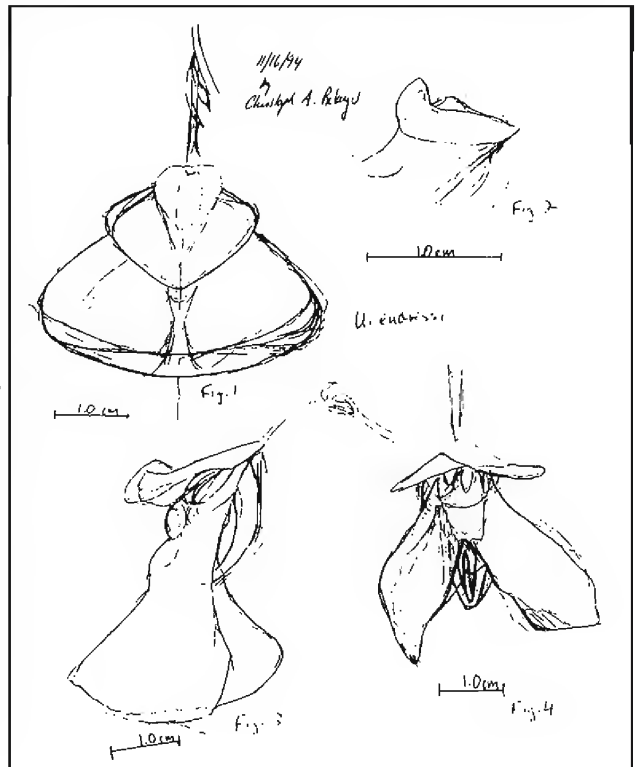
Nine species of *Utricularia* make up the section *Orchioides*, all of which grow in Central America, the Antilles and South America.¹ These species all grow in the moss and bark of tree trunks and have large, spectacular flowers and subsurface tubers. They are found at various altitudes, but the majority grow in mountainous regions. Their unique environmental expectations may explain why some, like *U. quelchii* and *U. campbelliana*, are nearly impossible to grow. To this day, I am still looking for the factors that are eluding me in the successful cultivation of these species.

Most carnivorous plant enthusiasts consider these species difficult because they rot easily if the conditions are wrong. Furthermore, they rarely flower, and even if they do the grower often fights a battle against rot which sets in soon afterwards. This has occurred several times with my own clone of *U. asplundii* and Barry Meyers-Rice has reported the same occurrence with *U. alpina*.² However, these difficulties can be avoided if the grower pays attention to the growth cycles of the plants. Over time, the cycle has become clear to me and I am writing to help others successfully grow and enjoy these truly beautiful *Utricularia*.

After several years of growing *U. asplundii*, it became evident the plant has an obscure growing cycle. This was very hard to detect because it seemed the plant was flowering at random times. Now, the cycle is clear. Here in the Northern Hemisphere, the winter growing period is initiated between late October and early November by a vigorous production of new leaves and flower stalks, and the flowers bloom in mid-January. It maintains this growth until about May/June at which point the rate of growth almost halts. It appears that the increase in temperatures triggers the dormancy.

My *U. endresii* exhibits a similar growth cycle. In the spring of 1993 my clone accidentally dried out considerably - it responded by losing all its leaves. At first, I assumed that the plant was lost since most *Utricularia* would not survive such a drought. But, I discovered the tubers were still intact and apparently healthy. I repotted it into a smaller pot in September, 1993. Once the temperatures cooled to 20°C (68°F) growth resumed, just like it does for *U. asplundii*, and produced a flower in December for the first time, suggesting these plants need a resting period to initiate flowering.

To test my hypothesis, I conducted a small experiment with *U. asplundii*. I divided the clone into two equal parts, potted both in a mixture of orchid bark and Sphagnum, and kept them in identical conditions during the winter. Both samples flowered during the winter. The following summer I kept one of them in the same wet conditions as I have in the past and it rotted. The other I kept dry, watering only to keep the medium from drying out completely. Growth stopped completely, but no leaves died down, the plant did not rot, and the tubers remained healthy. Once daytime temperatures cooled to 20°C (68°F) in August, growth resumed slowly. I maintained these temperatures, and two months later the plant



produced a flower stalk. This proved that these plants require a dry period in the hot summer, and cool temperatures in winter for them to flower during the winter months and survive.

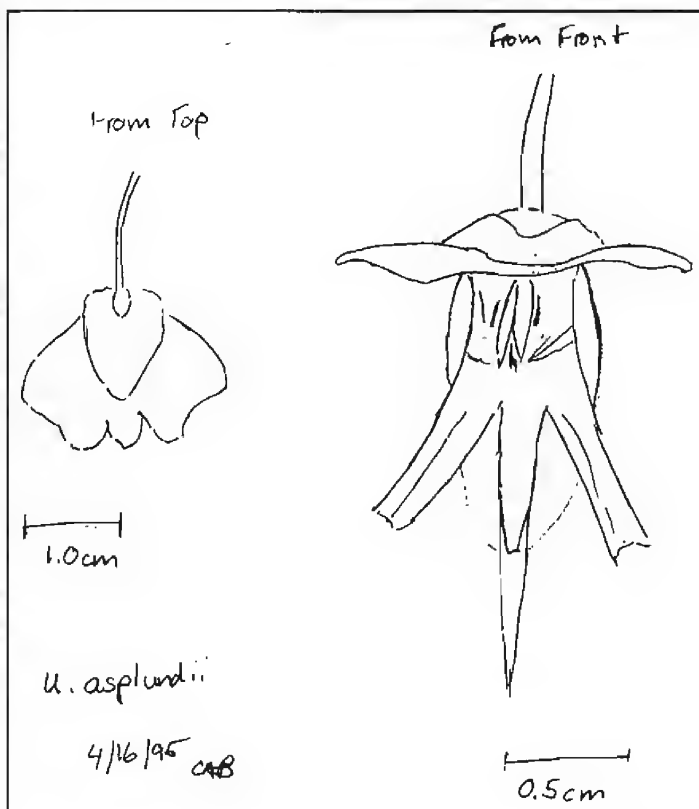
U. endressii can easily be distinguished from *U. asplundii*. First, the leaves of *U. endressii* die down completely during the summer months, leaving only the tubers, and second, the flower is lavender with a double crest. The 20cm leaves are much larger than the 12cm leaves of *U. asplundii*. Finally, *U. endressii* produces very few leaves, only about 3-5 per growing period, whereas *U. asplundii* produces leaves continuously.

The flower stalk of *U. endressii* is about 35cm long and has four light violet/lavender flowers. The lower lip is 4cm wide and about 4.5cm long. The spur is about 2.5cm long, curved upwards, and about half as long as the lower lip. This differs from Taylor's description, which claims the spur is as long as the lower lip. The base of the lower lip has a yellow bilobed crest. Further towards the base is another swelling, giving the flower a double crest. (Fig. 2) The upper lip is about 2.5cm long and about 3cm wide and is, corre-

sponding to Taylor's description, "transversely elliptic with apex rounded."³ (See Figures 1-4) Characteristics not mentioned by Taylor are the black coloration of the anthers, the cream coloration of the pollen, and the smell of the flowers. The smell is difficult to characterize. I find it revolting, musty and similar to the sharp smell of rotting potatoes, while a friend thinks it is close to pine resin. In any case, I would not compare the smell to the beauty of the flower itself.

The flowers of *U. asplundii* are as beautiful as those of *U. endressii*. They are borne on a 20-30cm long peduncle that, by the time the flowers open, drapes itself around neighboring plants. Each peduncle supports up to nine flowers, more than double the number Taylor says it should have.⁴ The flowers are smaller and certainly more delicate than those of *U. endressii*. The color is also different - they are white, with a very faint violet border around the edges that fades with time. The crest bears two longitudinal yellow stripes outlined in violet. Lorenz Bütschi published a beautiful photograph in CPN (Vol. 18, p. 17). In my plants the upper calyx lobes are roughly the same size, being about 1.5cm long and 1.0cm wide, broadly oval, with rounded apices (Fig. 6). The upper lip is transversely elliptic and measures 2.0cm wide and 1.5cm long. The lower lip is 1.5cm long and is 0.5cm wide near the crest and increases to 1.5cm wide at the widest expansion of the three lobes. The lower lip is divided into three equal lobes 0.5cm long giving the impression of a three-pronged fork. The spur is longer than the lower lip at 2.0cm long. Near the spur's halfway point there is a yellow marking. The anthers of *U. asplundii* are cream colored, unlike those of *U. endressii*. Overall, my clone is reminiscent of a spider plant with its drooping inflorescences and erect leaves.

If the grower pays close attention to the cycles of the species they will reward him or her with a beautiful spray of flowers. As medium for both *U. asplundii* and *U.*



endressi, I use a mixture of long fibered *Sphagnum* and orchid bark. This allows the plant stolons to breath and also makes it easy to control the moisture level of the medium, especieally during the dry season. As already mentioned the cycle of *U. endressi* is distinct. After the flower is spent, the flower stalk slowly turns yellow and dies. At this point, I cut it off. Several months later, in June, the leaves turn yellow and die. To prevent fungus, I remove them by pulling them gently away from the base. Usually they break off naturally at a joint-like structure at the medium surface. During the three hot summer months, the low temperatures barely dip below 20°C (68°F), I keep the dormant plant just barely moist, and occasionally allow it to dry out on the surface. As soon as the weather cools to a low temperature of 55°F (15°C), the first leaves appear, unfurling like the leaf of *D. binata*. Another is produced before the flower stalk appears and the cycle is complete.

If one is fortunate enough to be in possession of such a plant, the most important thing to remember is that these species require a resting period. If this is observed, the plant will reward the grower with a wealth of flowers that exceed the beauty of orchids. Maybe this will also lead others to think about how *U. quelchii* has adapted to its harsh environment atop Mt. Roraima and develop a way to grow it. In any event, the *Orchioides* section of *Utricularia* contains some of the prettiest and most rewarding plants to grow.

Acknowledgements

I would like to kindly thank Barry Meyers-Rice for reviewing this article and providing some very helpful comments.

References

¹ Peter Taylor, *The Genus Utricularia-a Taxonomic Monograph* (London: Her Majesty's Stationary Office, 1989), 407.

² Personal communication with Barry Meyers-Rice, Spring, 1994.

³ Ibid.

⁴ Ibid., p.420.

Literature Review

Kite, L. Patricia. 1995. Insect-eating plants. The Millbrook Press, Inc. 61 p.

This is a nice little book intended for younger readers (I would estimate ages seven or eight(advanced readers) to twelve or thirteen), and of course is an introduction. It is intelligently written for the young reader. There are fetching color photos throughout, a sampling of various genera of CP covered. The print is somewhat larger than usual and the printing and photos are crisp and clear, the paper excellent, and there is a good binding. There is a brief chapter on conservation, another on growing selected plants, and advice on finding more information. I think this is a good introduction for its purpose and should be in all grade and middle school libraries, and on your shopping list for that youngster in your family, or the kid next door always asking about your plants.

For purchase price information and postage requirements, write: The Millbrook Press, Inc., 2 Old Milford Road, Brookfield, CT 06804; or order through your local bookstore.

News and Views

Heiko Rischer (Kernerstr. 31, 71106 Magstadt, Germany)

Concerning *Nepenthes treubiana* Warb. type specimen (Warburg 20581): There was some vagueness in the past whether the type specimen of *N. treubiana* Warb. stored in the Museum Botanicum Berolinense had been destroyed in World War II or not (Jebb, M. (1991): An account of *Nepenthes* in New Guinea, 17 (1), p. 43). During a short visit in February 1995 I looked through the *Nepenthaceae* of the Herbarium and found the type specimen present. So it seems that a Neotype is not required.

Fernando Rivadavia (Sao Paulo, Brazil)

I would like to clear up some confusion regarding *Drosera montana*, *D. sessilifolia*, and *D. intermedia* "Brazil". First of all, I would like to say that what has been going around CP collections as *D. montana* "white flower" is actually some form of *D. spatulata*. There are no white-flowered *D. montana*, or at least no albino forms have been found yet. All *D. montana* varieties have light-lilac to pink-lilac flowers. The *D. montana*-complex is a messy group native to Brazil, Venezuela, and Bolivia which I believe will in the future be broken up into a few separate species. The TYPE *D. montana* plus a few of the varieties have tongue-shaped leaves (usually a deep-red color which carries on into cultivation) while others have spoon or wedge-shaped leaves.

Second of all, I have received seeds of *D. sessilifolia* from several sources and these have always grown into a South African species, maybe *D. aliciae* or *D. admirabilis*. The real *D. sessilifolia* are very similar to *D. burmanni*, so if yours do not, you can go ahead and erase their name tag.

Last of all, I have been seeing *D. intermedia* "Brazil" on numerous CP lists and am worried that this error might actually be my fault! Yes, this species does grow in Brazil, but I am almost sure that the so called *D. intermedia* "Brazil" are actually what is sometimes called *D. intermedia* "tropical", plants which never go dormant and which probably originate from the southeastern USA or Central America, I have traded large quantities of seed of *D. intermedia* "tropical" with CPers around the world and have a feeling one of these got a little confused, misunderstood that the "tropical" meant they were from Brazil and that I had collected them in the wild.

We have all heard of *D. intermedia* from Mt. Roraima (the large tepui where Brazil, Venezuela, and Guyana meet) and by what I know this species can also be found in other areas of northern South America. Surprisingly, *D. intermedia* has recently been discovered growing on the coast of eastern Brazil, in the states of Rio de Janeiro and Bahia. Actually, some of the collections are not that recent. What happened was that the herbarium specimens were inexcusably (as Peter Taylor likes to say) being confused with *D. capillaris* var. *brasiliensis* by inexperienced taxonomists.

Announcing CPCAT Version 1.0

What is CPCAT? CPCAT is a computerized carnivorous plant cataloging program developed to keep accurate records of taxonomic, geographic and personal information of CP specimens in a collection.

Over 14 years of growing CP, my collection has grown quite large. I found that trying to squish all pertinent information for each specimen on a "pot tag" was quite impossible. I was lucky if I could get the genus and species written in a permanent and legible label, let alone any location data. As an alternative I kept a journal, with codes to identify each plant. In the journal, was the name of the plant, the plant's original geographic location (if it was known) and who or where I got it from. Hybrid, parentage information was also noted. This method helped me keep my records straight. However, making additions, deletions and updates became quite messy. Sorting alphabetically wasn't an option! It was the concept of this journal and its limitations, that gave me the idea to develop this software package.

CPCAT is a computerized solution to the cataloging problem, specifically designed for the management of Carnivorous Plant Collections. In addition to the ease of collection management, CPCAT will also generate hardcopy listings of particular genus' within a collection, or print out a listing of the entire collection. This listing can be detailed or concise and make ideal trading/selling lists. Now, each "pot tag" is a link to a database entry that holds a wealth of information about a given specimen.

CPCAT will be available for shipping in July of 1995 and will sell for \$30.00 US (\$20.00 for the Software, \$5.00 for shipping and \$5.00 donation to the International Carnivorous Plant Society)

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